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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,061	09/25/2003	Joel Howard Schopp	AUS920030450US1	5834

29125 7590 10/06/2005

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EXAMINER

PHAN, RAYMOND NGAN

ART UNIT	PAPER NUMBER
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2111

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/671,061

Applicant(s)

SCHOPP, JOEL HOWARD

Examiner

Raymond Phan

Art Unit

2111

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>09252003</u> . | 6) <input type="checkbox"/> Other: ____.  |

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### **Part III DETAILED ACTION**

#### ***Notice to Applicant(s)***

1. This application has been examined. Claims 1-33 are pending.
2. The Group and/or Art Unit location of your application in the PTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 2111.

#### ***Specification***

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

#### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants Admitted Prior Arts (hereinafter AAPA) in view of Tucker (US No. 6,233,204).

In regard to claims 1, 12, 23, AAPA discloses a method for managing a mutex in a data processing system, the method comprising: maintaining an average acquisition cost value for a mutex; attempting to acquire the mutex by a first thread (see figure 3); and in response to a determination that the mutex has already been acquired by a second thread, determining to enter a spin state or a sleep state on the first thread (see figure 3). But AAPA does not disclose the step of maintaining an average acquisition cost value for a mutex; and determining to enter a spin state or

a sleep state on the first thread based on the average acquisition cost value for the mutex. However Tucker discloses the step of maintaining an average acquisition cost value (i.e. LWP identifier) for a mutex (see col. 5, lines 2-45); and determining to enter a spin state or a sleep state on the first thread based on the average acquisition cost value for the mutex (see col. 4, lines 7-22). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 2, 13, 24, Tucker discloses wherein the average acquisition cost value indicates an average consumption of computational resources by threads in acquiring the mutex (see col. 5, lines 2-45). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 3, 14, 25, Tucker discloses the step of maintaining a thread-specific current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex (see col. 5, lines 2-45); and in response to the first thread acquiring the mutex, recomputing the average acquisition cost value for the mutex to include the thread-specific current acquisition cost value (see col. 5, lines 2-45). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings

of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 4, 15, 26, Tucker discloses the step of entering a spin state if the average acquisition cost value satisfies a first condition (see col. 5, lines 19-45); and entering a sleep state if the average acquisition cost value satisfies a second condition (see col. 5 lines 25-45). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 5, 16, 27, Tucker disclose wherein the first condition is that the average acquisition cost value is less than a threshold value, and wherein the second condition is that the average acquisition cost value is greater than or equal to a threshold value (see col. 5, lines 25-45). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 6, 17, 28, Tucker discloses wherein the threshold value is related to an amount of time that is required by a thread to enter and then exit a sleep state (see col. 5, lines 35-49). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 7, 18, 29, Tucker discloses the step of entering a spin state or a sleep state on the first thread; and after exiting the spin state or the sleep

state on the first thread, computing or retrieving a cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state (see col. 5, lines 2-45). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 8, 19, 30, AAPA discloses the step of entering a spin state on the first thread by executing a busy-wait loop (see figure 3). But AAPA does not disclose the step of computing the cost value that indicates a consumption of computational resources by the first thread during the spin state based on a number of iterations that are executed within the busy-wait loop. However Tucker discloses the step of computing the cost value that indicates a consumption of computational resources by the first thread during the spin state based on a number of iterations that are executed within the busy-wait loop (see col. 5, lines 2-45). Therefore, it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 9, 20, 31, Tucker disclose the step of entering a sleep state on the first thread by executing a system call to suspend execution of the first thread; and computing the cost value that indicates a consumption of computational resources by the first thread during the sleep state based on an amount of time that the first thread is in the sleep state (see col. 5, lines 10-45). Therefore it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within

the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 10, 21, 32, Tucker discloses the step of adding the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state to a current acquisition cost value that represents a consumption of computational resources by the first thread after an initial attempt to acquire the mutex and prior to acquiring the mutex (see col. 4, lines 34-57). Therefore it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

In regard to claims 11, 22, 33, Tucker discloses normalizing the cost value that indicates a consumption of computational resources by the first thread during the spin state or the sleep state prior to adding it to the current acquisition cost value (see col. 5, lines 2-45). Therefore it would have been obvious to a person of an ordinary skill in the art at the time the invention was made to have combined the teachings of Tucker within the system of AAPA because it would reduce the excessive period of time waiting for the thread requests.

### ***Conclusion***

6. All claims are rejected.
7. The prior arts made of record and not relied upon are considered pertinent to applicant's disclosure.

**Spix et al. (US No. 5,179,702)** disclose a system and method for controlling highly parallel multiprocessor using an anarchy based scheduler for parallel execution thread scheduling.

**Wipfel et al. (US No. 6,353,898)** disclose a resource management in a clustered computer system.

**Kosche et al. (US No. 6,427,235)** disclose a method and apparatus for performing prefetching at the critical section level.

**Nishihara et al. (US No. 6,026,427)** disclose a condition variable to synchronize high level communication between processing threads.

**McKenney (US No. 6,886,162)** discloses a high speed methods for maintaining a summary of thread activity for multiprocessor computer systems.

**Lane (US Pub No. 2002/0095434)** discloses a performance modeling based upon empirical measurements of synchronization points.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Raymond Phan, whose telephone number is (571) 272-3630. The examiner can normally be reached on Monday-Friday from 6:30AM- 4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Primary, Paul Myers can be reached on (571) 272-3639 or via e-mail addressed to paul.myers@uspto.gov. The fax phone number for this Group is (571) 273-8300.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [raymond.phan@uspto.gov].


All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see [hop://pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 central telephone number is (571) 272-2100.

**Raymond Phan**  
Sept 28, 2005

RP

  
**TIM VO**  
**PRIMARY EXAMINER**